

Routine HIV Testing: Inpatient, Outpatient & Cost-effectiveness

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“Screening for HIV Infection Can we afford the false positive rate?”

- The case against routine HIV testing
 - False positives
 - Ethics
 - HIV is “different”

Paradigm Shift

- Perception of HIV infection has changed
- HIV tests have better performance characteristics
- Treatment (ART) is highly effective
- HIV case identification is the key to prevention

Characteristics Screening Test

- Significant public health problem
- Test has adequate sensitivity and specificity
- Test is acceptable and easily performed
- Intervention and treatment alter the disease course

CDC HIV Counseling, Testing, and Referral (CTR) Guidelines

- Routine, voluntary HIV CTR for all patients in hospitals with $\geq 1\%$ HIV prevalence
- These guidelines are rarely followed

The Bottom Line...

- Expanded HIV CTR services are feasible and can have high yield.
- HIV CTR can be justified at prevalences <1% as recommended by the CDC.
- Routine HIV CTR is a highly cost-effective use of health care dollars in the US.

The Inpatient Testing Experience

Boston Medical Center 4/99-6/00

- Patients admitted to the medical service were offered HIV counseling and testing
- MA DPH funded on-site counselors
- 473 (6.4%) of the 7,356 medical admissions were voluntarily tested for HIV
- The CTR program was compared to a period of historical control (1/98-3/99)

Results

Inpatient Testing

	HIV testing referrals	Number of HIV+ tests	HIV prevalence among referred
Control Period 1/98-3/99	140	20	14.3% (8.5, 20.0)
Program Period 4/99-6/00	473	32	6.8% (4.5, 9.0)

Results

Inpatient Testing

- 15-18 patients approached per day, 6-8 tested
- 84 patients identified as HIV-infected
- 81/84 (96%) returned for results
- 81/81 (100%) are in care
- HIV prevalence among those tested ~2%

Program Expansion

Urgent Care Setting

- Expansion to urgent care setting
- Established a program called “Think HIV”

Think HIV

Objectives

- 1) Establish “Think HIV” in 4 Massachusetts urgent care centers
- 2) Identify and refer to care patients with undiagnosed HIV infection
- 3) Determine the seroprevalence of undiagnosed infection

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Wednesday 8:00-9:30

Results

Outpatients

- January – September 2002
- Think HIV offered >7,000 patients HIV testing
- 2,444 (37%) accepted testing

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Results

Outpatients

- 48/2,444 (2.0%) undiagnosed HIV-infected patients identified
- 42/48 (88%) patients returned for test results
- 42/42 (100%) who returned for results linked to care
- Cost per case identified = \$4,850

Some Feedback. . .

“The price tag probably makes the program too expensive for most states. . . I don't think it will work in the urgent care centers at a suburban mall”

Director, Yale AIDS Program
Reuters

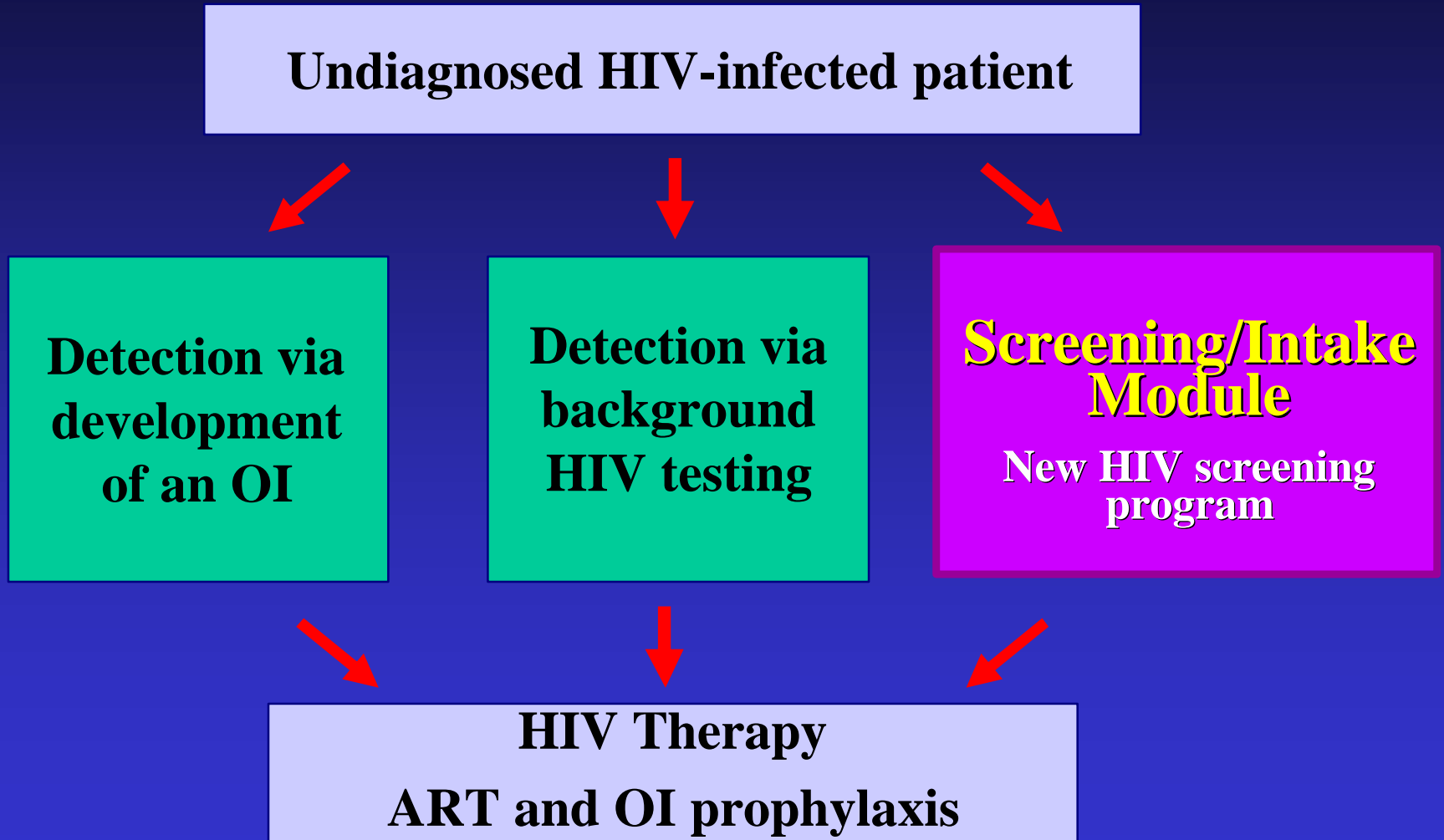
Is routine HIV screening cost-effective?
If so, at what HIV prevalence?

Cost-effectiveness of HIV Screening Objectives

- To evaluate the clinical and cost-effectiveness of routine HIV screening programs among inpatient and outpatient populations.

CDC (S1396-20/21), NIMH (R01 MH65869)

Methods Overview



Cost-effectiveness of Routine HIV Testing

Inpatients

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Tuesday 3:30-5:00

Results

Inpatient Cost-effectiveness

Prevalence	Population (QALMS)	HIV+ (QALMS)	Cost (\$)	Cost-effectiveness (\$/QALY)
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1.0%

No Testing	204.10	72.30	\$1,200	---
Testing	204.20	81.77	\$1,500	\$38,600

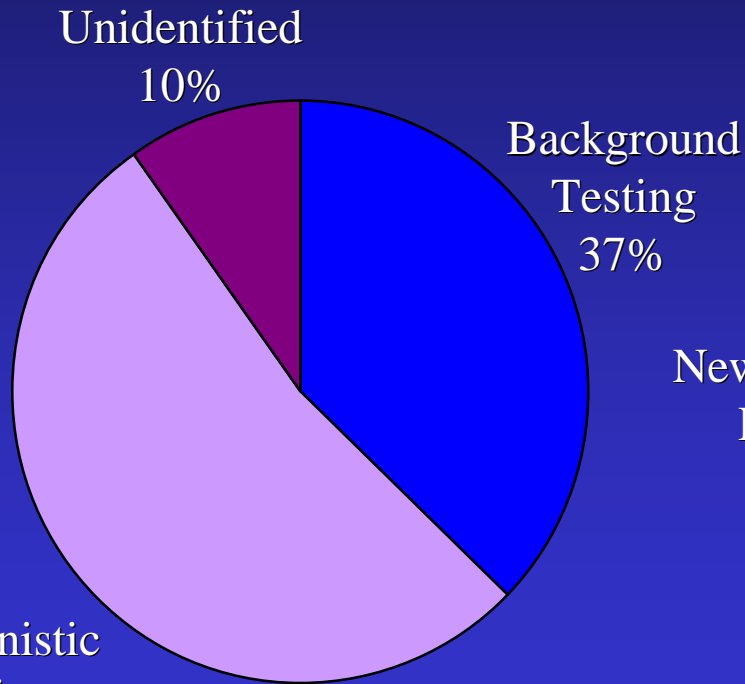
0.1%

No Testing	205.30	72.30	\$120	---
Testing	205.31	81.77	\$160	\$50,000

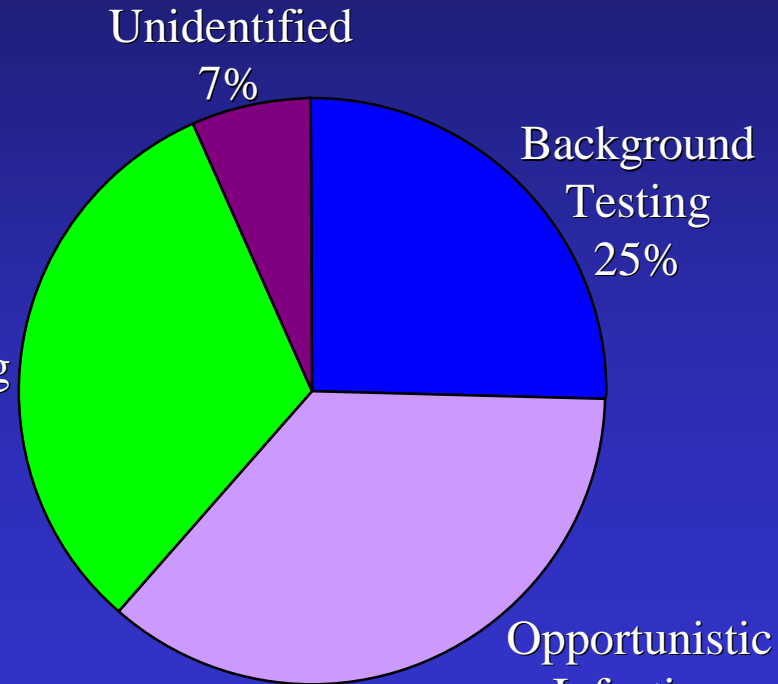
Results

Mechanisms of HIV Detection

Without HIV CTR Program



With HIV CTR Program



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Cost-effectiveness of Routine HIV Testing

Outpatients

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Three Target Populations

	Undiagnosed HIV Prevalence (%)	Monthly HIV Incidence (%)
High-Risk	3.0	0.1
CDC Threshold	1.0	0.01
US Overall	0.1	0.0012

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Tuesday 3:30-5:00

Results

Outpatient Cost-effectiveness

- In a high risk population, HIV testing every five years had a cost-effectiveness ratio of \$67,000/QALY gained.
- At the CDC threshold, HIV testing every ten years had a cost-effectiveness ratio of \$57,000/QALY gained.
- Even in the “US Overall Population” a one-time HIV test may be cost-effective: \$39,000/QALY gained.

Cost-effectiveness Ratios for Other Screening Programs

Screening Program	C-E ratio (\$/QALY)*	Reference
HIV screening inpatients	\$38,600	Current Analysis
Breast cancer screening		
Annual mammogram, women 50–69 y/o	\$57,500	Salzmann Ann Intern Med 1997
Colon cancer		
FOBT + SIG q5y, adults 50–85 y/o	\$57,700	Frazier JAMA 2000
HIV screening every 5 years		
high risk patients	\$67,000	Current Analysis
Diabetes Mellitus, Type 2		
fasting plasma glucose, adults >25 y/o	\$70,000	CDC C-E Study Grp. JAMA 1998

*all costs adjusted to 2001 US dollars

Conclusions

- Routine, voluntary HIV testing programs in both the inpatient and outpatient setting are feasible and can have a high yield of HIV case identification (2.0-6.8%).
- C-E models demonstrate that inpatient HIV screening is cost-effective at an undiagnosed HIV prevalence of 1.0% (likely 0.1%).
- C-E models demonstrate that one-time HIV screening in the US is cost-effective.
- Expansion of routine HIV CTR programs nationally should be a public health priority.

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